UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 58520

CSAH NO. 61

OVER THE

KETTLE RIVER

DISTRICT 1 - PINE COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 71)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 58520, Piers 1 and 2, were found to be generally in good condition with no structurally significant defects observed. The steel piles exhibited coating failure with light surface corrosion and some pitting. A moderate accumulation of timber debris was observed at the upstream end of Pier 1. The channel bottom around the substructure units and the shorelines appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) The steel piles exhibited coating failure on 80 to 100 percent of the surface area, and light surface corrosion with rust nodules and up to 1/16 inch deep pitting on 50 percent of the surface area, from 3 feet above the waterline to the channel bottom.

(B) A moderate accumulation of timber debris, including a 12-inch-diameter tree, was observed at the upstream end of Pier 1, and an 18-inch-diameter tree was observed extending along the north side of Pier 1.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years. Monitor the drift accumulation at Pier 1 during future inspections.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 58520

Feature Crossed: The Kettle River

Feature Carried: CSAH No. 61

Location: District 1 - Pine County

Bridge Description: The superstructure consists of three spans of multiple concrete beams supporting a reinforced concrete deck. The superstructure is supported by two abutments and two concrete filled steel shell pile piers. The piers are numbered 1 and 2 starting from the south end of the structure.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: September 25, 2002

Weather Conditions: Rain, ±50^{o} F

Underwater Visibility: ±1.0 foot

Waterway Velocity: ±1.0 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers consist of a single line of ten concrete filled steel shell piles supporting a reinforced concrete pier cap.

Maximum Water Depth at Substructure Inspected: Approximately 6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the upstream end of Pier 1.

Water Surface: The waterline was approximately 19.0 feet below reference. Water Elevation = 1011.8.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

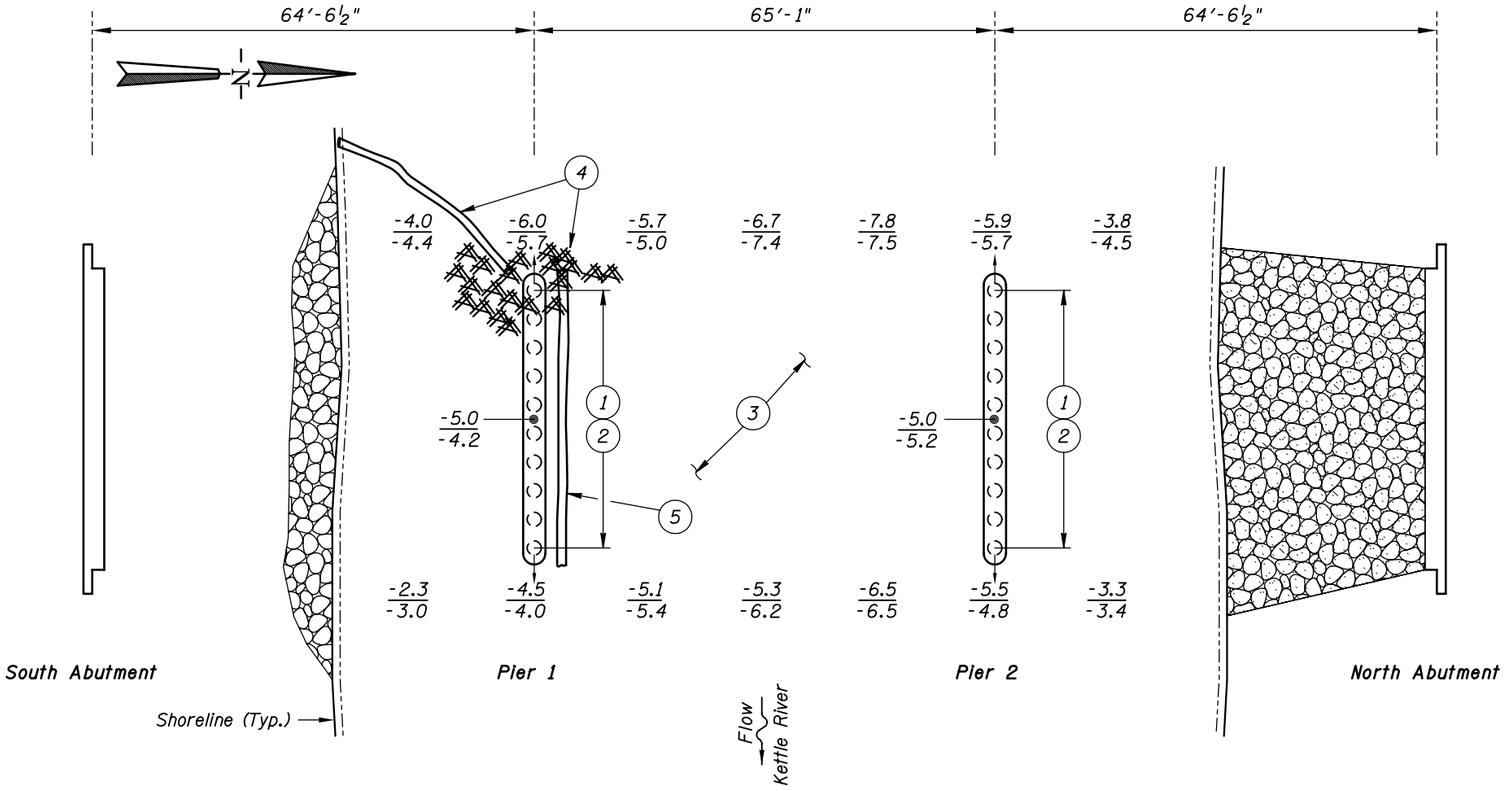
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/9/02

Item 113: Scour Critical Bridges: Code J/97

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes _X_ No



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on September 25, 2002, the waterline was located 19.0 feet below the top of the pile cap on the upstream end of Pier 1. This corresponds to a waterline elevation of 1011.8 feet based on the previous report dated August 27, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

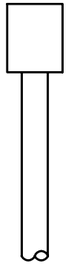
(1) The steel piles exhibited coating failure on 80 to 100 percent of the surface area from 3 feet above the waterline to the channel bottom.

(2) The steel piles exhibited light surface corrosion with rust nodules and up to 1/16 inch of pitting on 50 percent of the surface area from 3 feet above the waterline to the channel bottom.

(3) The channel bottom material consisted of sandy gravel and approximately 4-inch-diameter cobbles with up to 1 foot probe rod penetration.

(4) A moderate accumulation of timber debris, including a 12-inch-diameter tree, was observed at the upstream end of Pier 1.

(5) An 18-inch-diameter tree was observed along the north side of Pier 1.



TYPICAL END VIEW OF PIERS

Legend

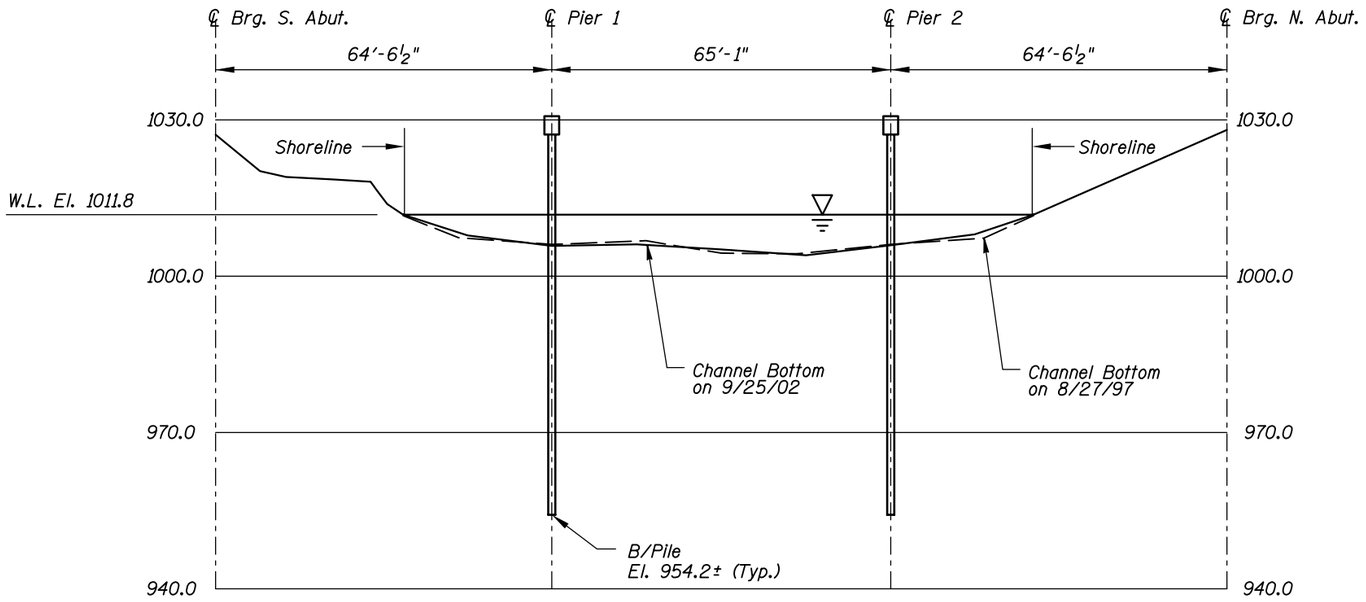
-2.0 / -5.2	Sounding Depth from Waterline (8/23/02) / Sounding Depth from Waterline (8/25/97)
	Concrete Filled Steel Pile
	Concrete Filled Battered Steel Pile
	Timber Debris
	Sand Infilled Riprap
	Riprap

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

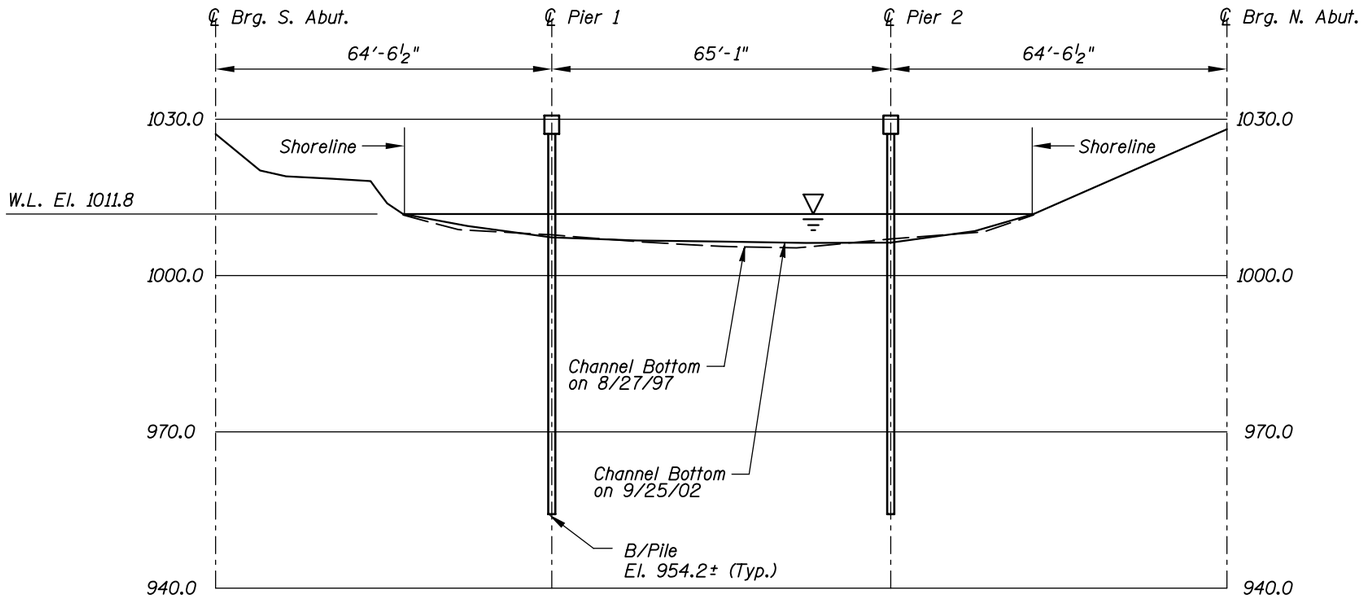
STRUCTURE NO. 58520
OVER THE KETTLE RIVER
DISTRICT 1, PINE COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120071		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
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UNDERWATER BRIDGE INSPECTION

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DISTRICT 1, PINE COUNTY

UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=30'
Code: 35120071		Figure No.: 2

Photograph 1. View of Structure, Looking Northeast.

Photograph 2. View of Pier 1, Looking East.

Photograph 3. View of Pier 2, Looking Northeast.

Photograph 4. View of Timber Debris at the Upstream Nose of Pier 1, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 25, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 58520 WEATHER: Rain, "50° F

WATERWAY CROSSED: The Kettle River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR

OTHER

PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel

EQUIPMENT: SCUBA, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 5:45 P.M.

TIME OUT OF WATER: 6:00 P.M.

WATERWAY DATA: VELOCITY "1 fps

VISIBILITY "1 foot

DEPTH 6 feet maximum at Piers 1 and 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the steel piles were generally in good condition with no structurally significant defects observed. The steel piles exhibited coating failure on 80 to 100 percent of the pile surfaces and rust nodules with up to 1/16 inch deep pitting on 50 percent of the surface area from 3 feet above the waterline to the channel bottom. A moderate accumulation of timber debris was observed at Pier 1. The channel bottom appeared stable with no evidence of significant scour.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years. Monitor the drift accumulation at Pier 1 during future inspections.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 58520
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Kettle River

INSPECTION DATE September 25, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	6.0’	7	N	N	9	N	7	8	8	8	6	6	N	7	N	7	N	N
	Pier 2	5.9’	7	N	N	9	N	7	8	8	8	8	8	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the steel piles were generally in good condition with no structurally significant defects observed. The steel piles exhibited coating failure on 80 to 100 percent of the pile surfaces and rust nodules with up to 1/16 inch deep pitting on 50 percent of the surface area from 3 feet above the waterline to the channel bottom. A moderate accumulation of timber debris was observed at Pier 1. The channel bottom appeared stable with no evidence of significant scour.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.